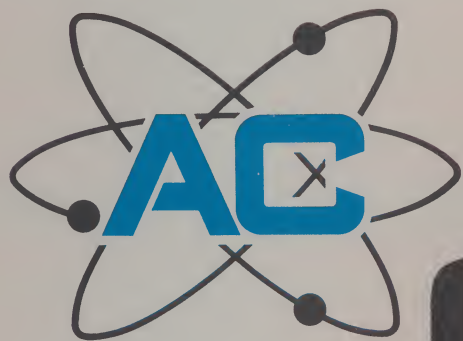
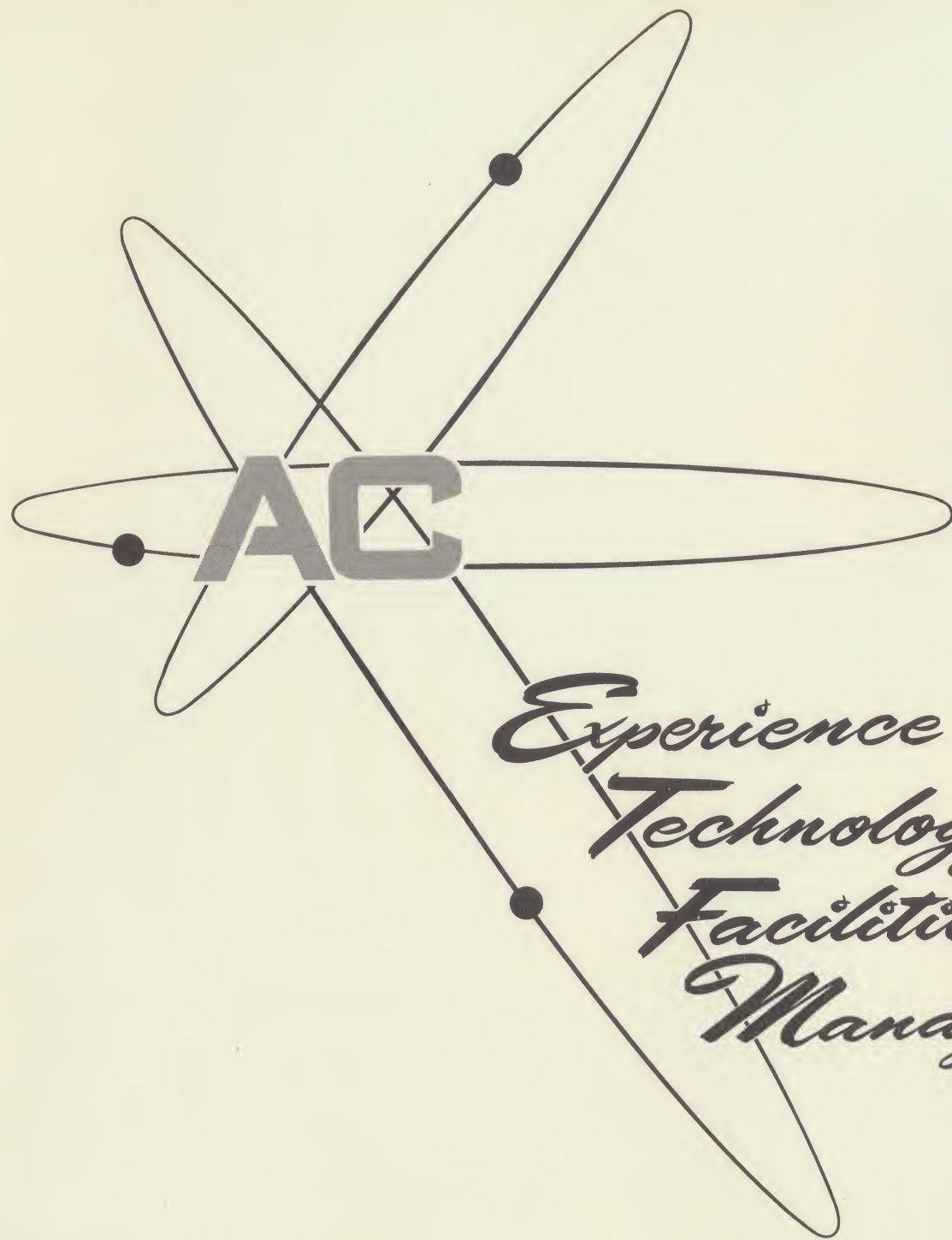




capability



AC ELECTRONICS DIVISION OF GENERAL MOTORS CORPORATION



*Experience
Technology
Facilities
Management*

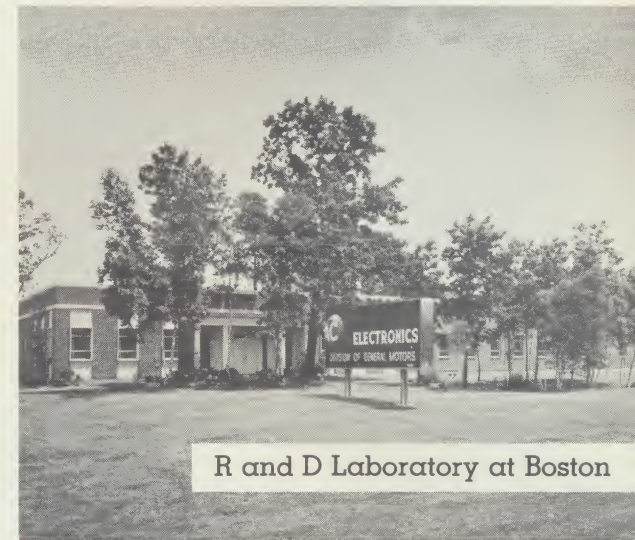
Experience LEADERSHIP

AC Electronics has long pioneered in the development and production of precision inertial guidance systems and components. Such equipment has served guidance and control functions in many significant defense and aerospace applications.

In all fields — research and development, engineering, production, operational reliability and field technical service — AC Electronics has earned an unqualified reputation for excellence. This unique capacity to exercise systems responsibility through all phases of development, from drawing board to operational readiness, has earned AC Electronics a leading position in total systems capability.



R and D Laboratory at Los Angeles



R and D Laboratory at Boston



Research, Development, and Production Complex at Milwaukee



TITAN II ICBM with AC Guidance System

Experience ACHIEVEMENT

In less than two decades, AC Electronics has compiled an impressive record of achievement. Initial successes include the K-series bombing navigation systems for B-50, B-36, and B-47 aircraft and the A-4 gun-bomb-rocket sights. Later came the Stellar Inertial Bombing System (SIBS), forerunner of the AC guidance systems used in THOR, MACE, and TITAN.

Projects currently underway at AC include guidance systems for the TITAN II ballistic missile and TITAN III space booster, guidance and navigation equipment for the APOLLO and LEM spacecraft, the ASQ-48 Bombing Navigational System for B-52 C and D aircraft, the ASN-47 Low Altitude Navigation System, integrated avionics systems, and tank fire control systems.

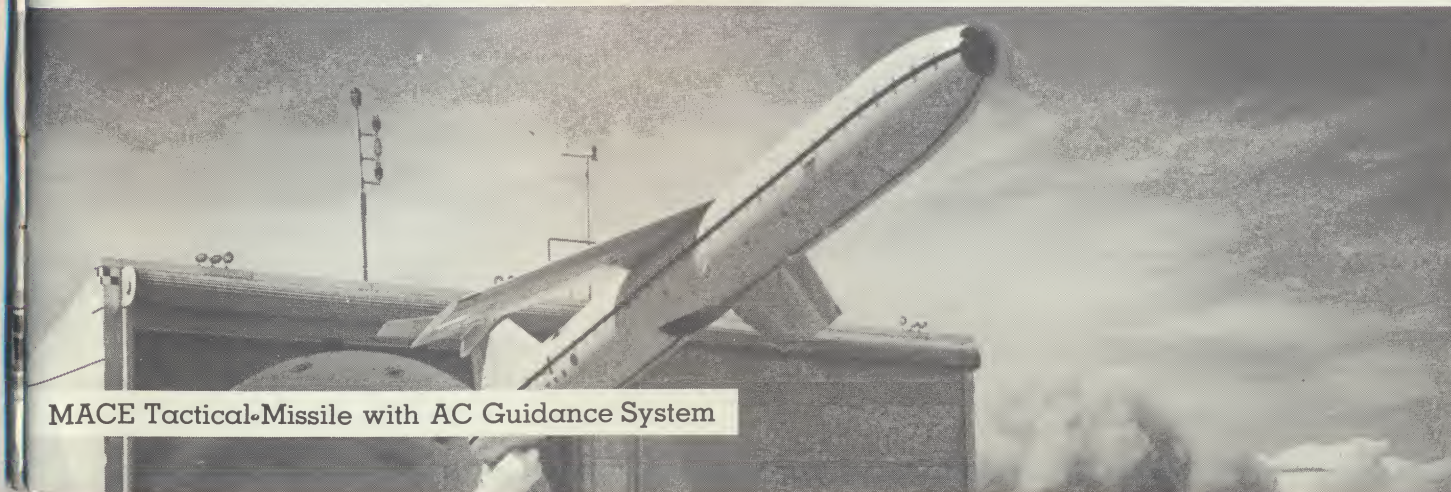


SAC B-52 Aircraft with AC-Supplied Bombing Navigational System

Experience BACKGROUND

In 1948, a group of technical and management personnel from AC Spark Plug Division headquarters in Flint, Michigan, was selected as the nucleus of AC Spark Plug — Milwaukee Operations, later to become the AC Electronics Division.

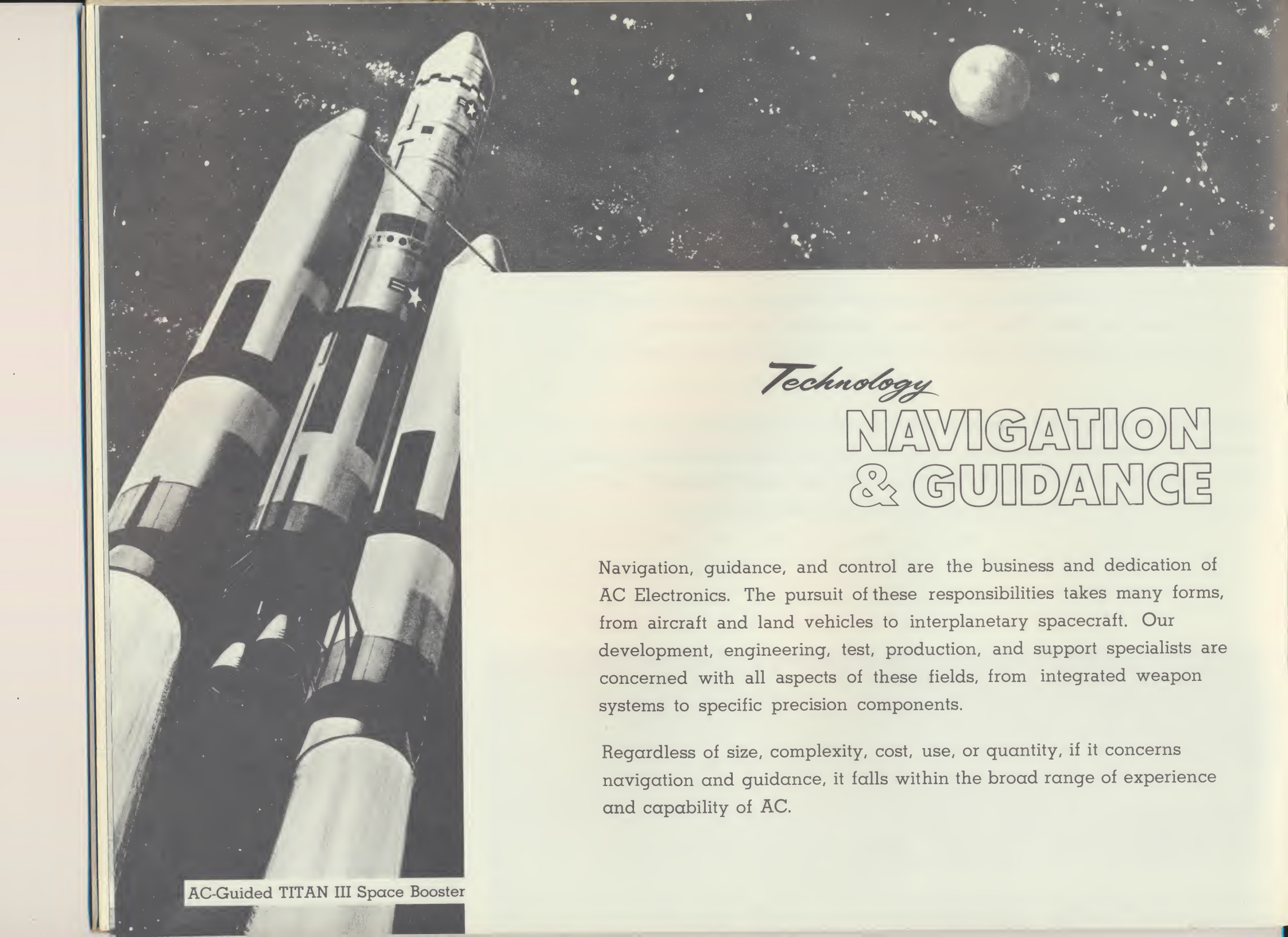
Today, that nucleus has grown to a force of approximately 6,000 people working in more than 1½ million square feet of plant space in the Milwaukee area. Supporting facilities for AC-Milwaukee include modern research and development laboratories in the Los Angeles and Boston areas.



MACE Tactical-Missile with AC Guidance System



THOR IRBM with AC Inertial Guidance



Technology

NAVIGATION & GUIDANCE

Navigation, guidance, and control are the business and dedication of AC Electronics. The pursuit of these responsibilities takes many forms, from aircraft and land vehicles to interplanetary spacecraft. Our development, engineering, test, production, and support specialists are concerned with all aspects of these fields, from integrated weapon systems to specific precision components.

Regardless of size, complexity, cost, use, or quantity, if it concerns navigation and guidance, it falls within the broad range of experience and capability of AC.

AC-Guided TITAN III Space Booster

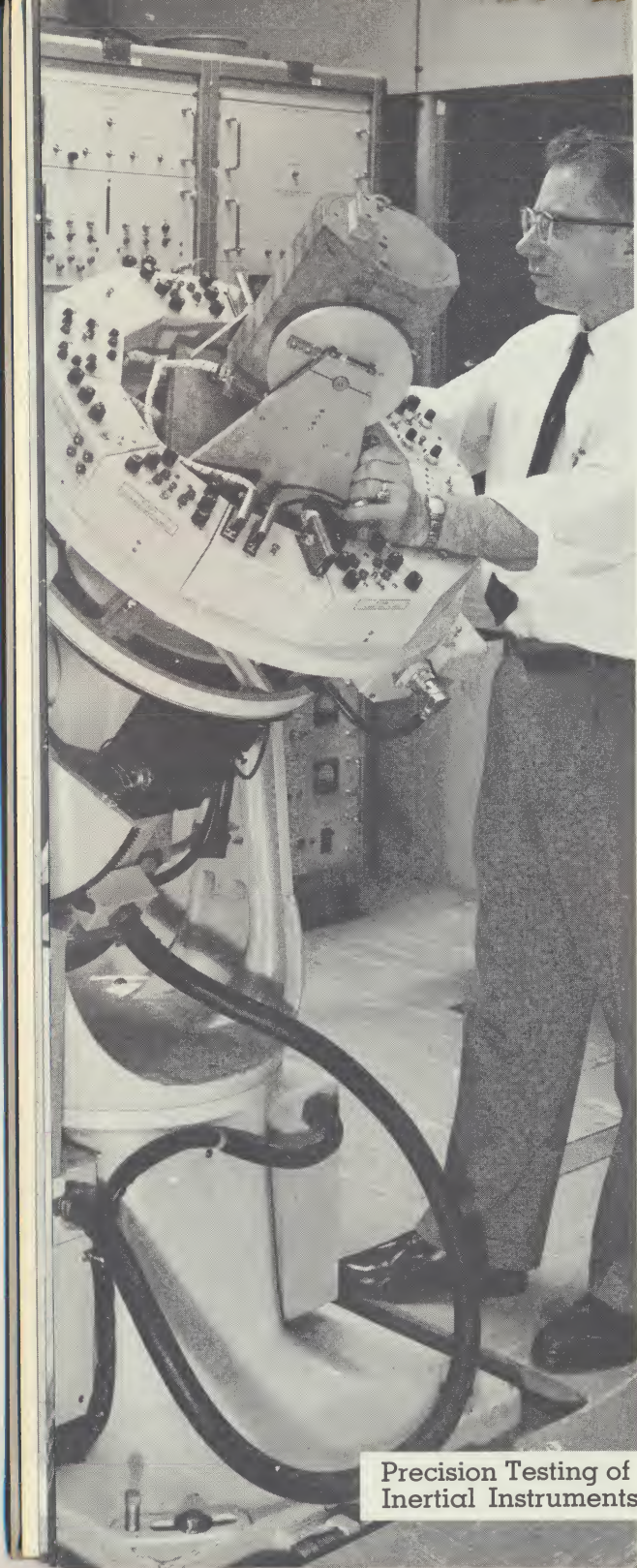
Technology TECHNICAL EXCELLENCE

The rapid emergence of AC as a major producer of aerospace equipment has been due in large measure to the technical excellence of its products and services. This attribute is manifest in every phase of activity — in evolving new concepts, in designing new products and improving existing ones, and in manufacturing and supporting complete systems, inertial instruments, and digital computers.

At AC Electronics, technical excellence is not simply considered a desirable attribute — it is the very basis of our competitive existence.



APOLLO Space Vehicle with AC
Guidance and Navigation Equipment



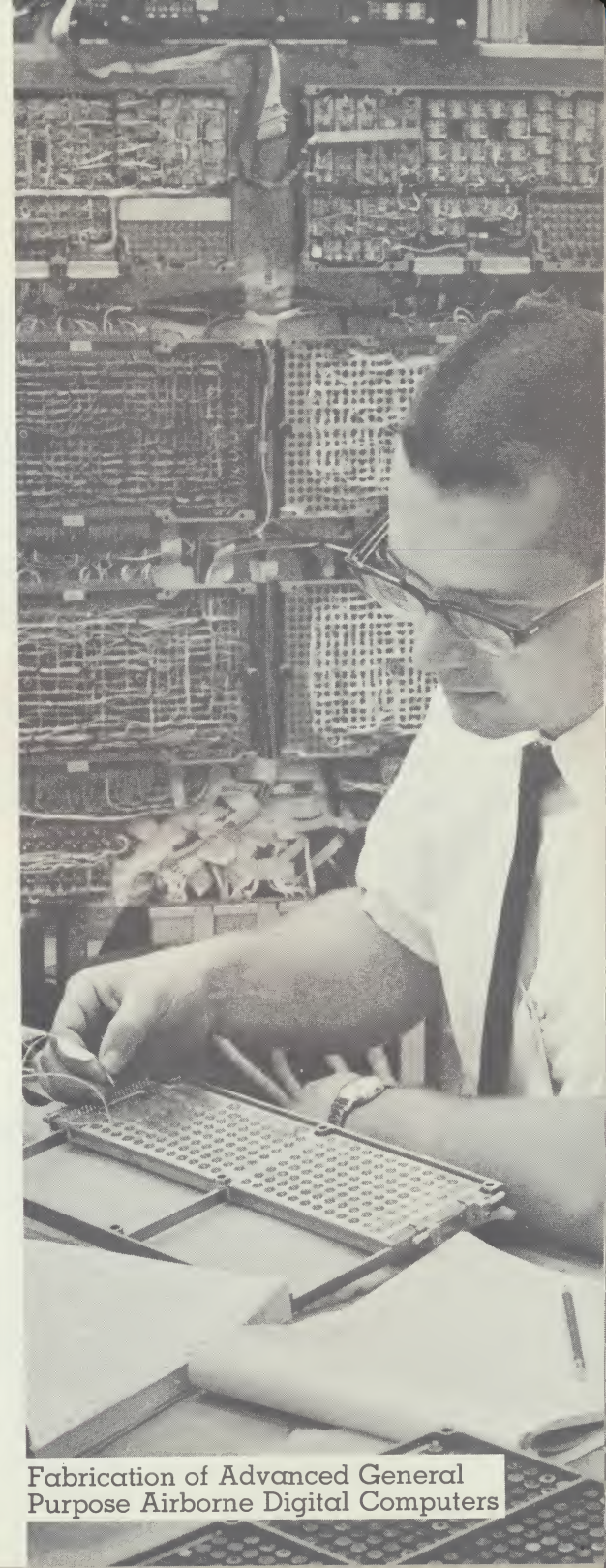
Precision Testing of
Inertial Instruments

Technology RESEARCH AND DEVELOPMENT

Enduring success in the aerospace industry depends heavily upon a carefully planned, forward looking research and development activity. AC carefully evaluates, on a continuing basis, the future needs of its customers and directs major attention to those areas of research and development where technological achievement can most purposefully be applied. Current research and development are concentrated on advanced navigation, guidance, and control systems for aircraft, surface vehicles, missiles, and spacecraft. Components activity includes gyroscopes, accelerometers, digital computers, and integrated microcircuits.

Technology DESIGN ENGINEERING

AC Electronics design engineers translate advanced navigation, guidance, and control concepts into the precision components and systems required to satisfy specific customer needs. Systems engineering specialists define the mechanization, and equipment engineers build and evaluate prototype models and support manufacturing operations after product release. To assure that accuracy, reliability, and maintainability goals are achieved within established time and cost constraints, the services and facilities of other specialists are employed. This includes work in circuit selection, ultra-precision measurement, environmental testing, statistical analysis, computer simulation, human factors, and maintenance engineering.



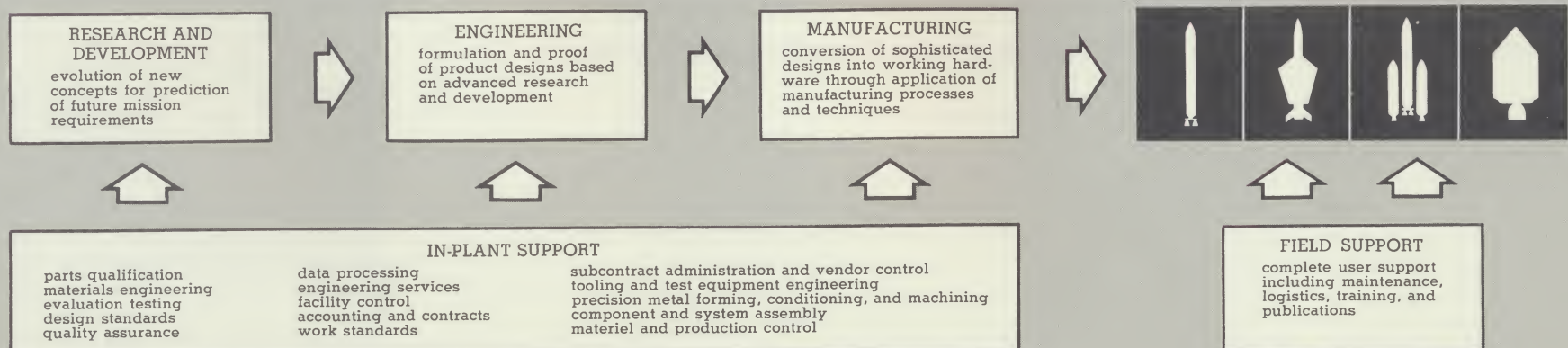
Fabrication of Advanced General Purpose Airborne Digital Computers

Technology SYSTEMS RESPONSIBILITY

AC Electronics operates as an integrated systems activity, capable of conducting a total program effort. This total systems responsibility encompasses technical management, as well as the coordination of contractors and suppliers. It includes the interrelated functions of applied research and development, design formulation and evaluation, product manufacture, and user support.



Avionic Systems for Attack Aircraft

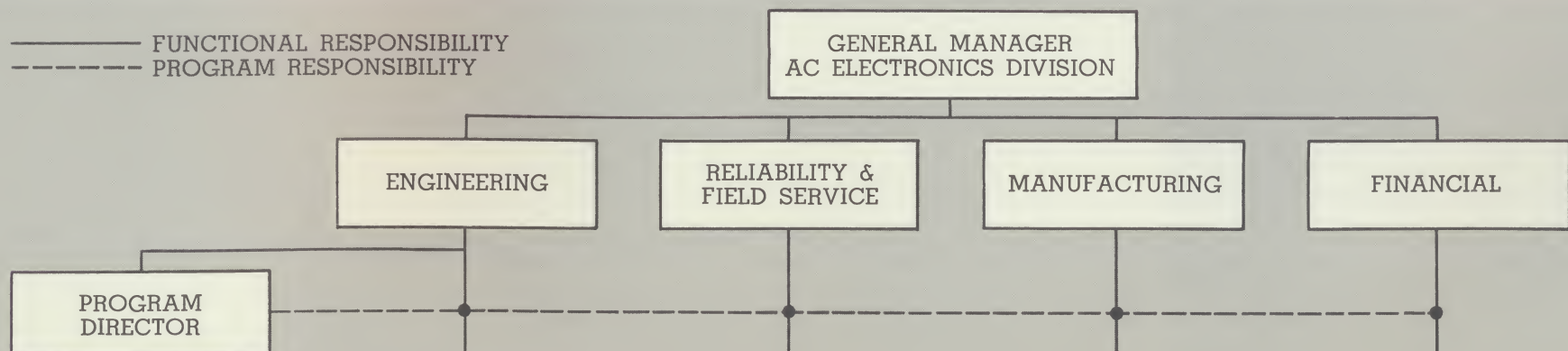


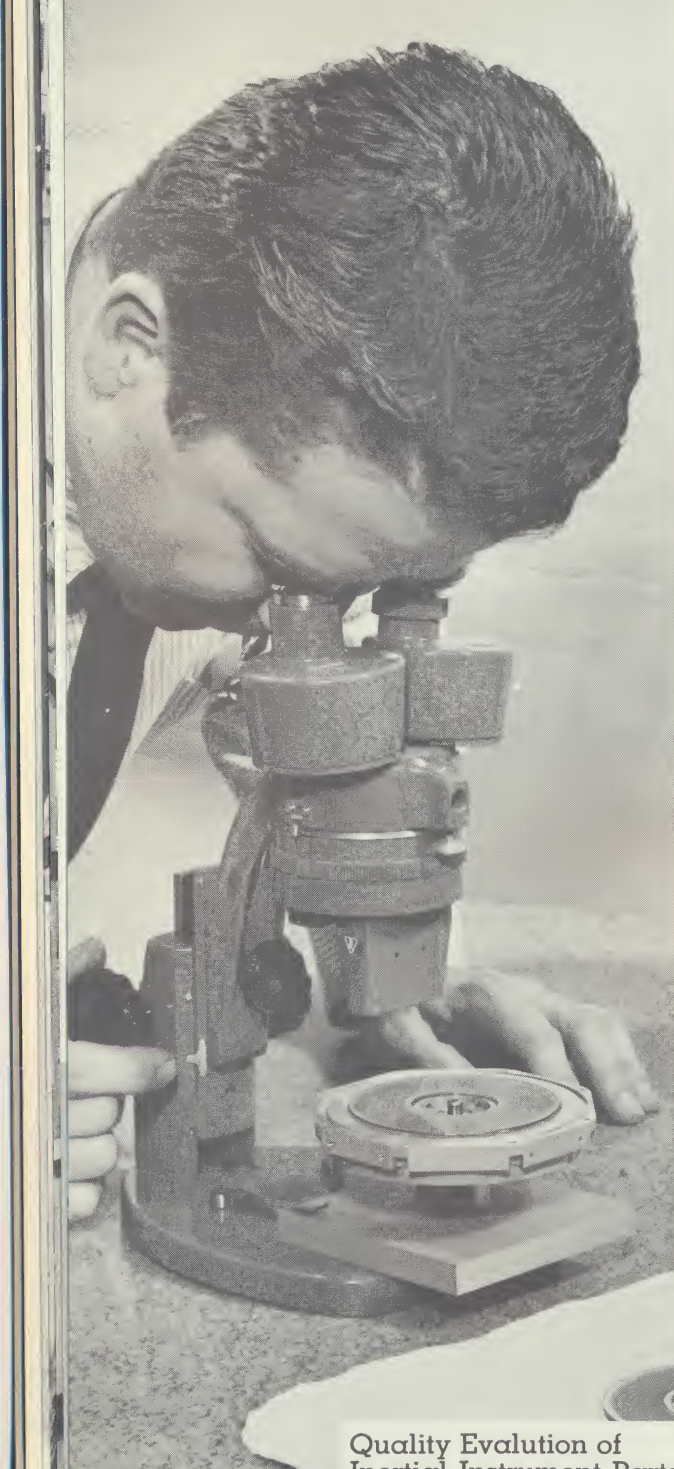


APOLLO Lunar Excursion Module with AC Electronics guidance and navigation equipment.

Technology PROGRAM MANAGEMENT

At AC Electronics, the Program Director and his staff, together with the functional groups, constitute a matrix-type organization. Program tasks are directed by the Program Director and efficiently executed by functionally oriented specialists. The Program Director and staff serve as the focal point of internal program management and customer contact. This type of management has been most effective on the AN/ASQ-48, ALRI, TITAN II, TITAN III and APOLLO programs.





Technology

RELIABILITY AND MAINTAINABILITY

At AC, reliability is made an integral part of product design, then carefully monitored during production and use. Key tools are parts qualification, design reliability allocation and prediction, and quality audit at each line operation. Discrepancy reporting is used to institute corrective action, to predict reliability growth, and to increase confidence levels of future predictions and allocations. Like reliability, maintainability is built into the product through early requirements analysis, allocation, prediction, indoctrination, design review, and demonstration.

Quality Evalution of
Inertial Instrument Parts

Technology PRODUCTION ENGINEERING

The stringent performance requirements of guidance and navigation components demand production excellence in terms of precision, cleanliness, and miniaturization. The techniques, methods, and processes necessary to produce advanced designs are devised and performed by Production Engineering groups. To make a smooth transition from design to finished product, special tooling and test equipment are designed, improved machining techniques are perfected, and the latest technological developments in plastics, metallurgy, chemistry, plating, welding, and cleaning are incorporated into manufacturing operations.



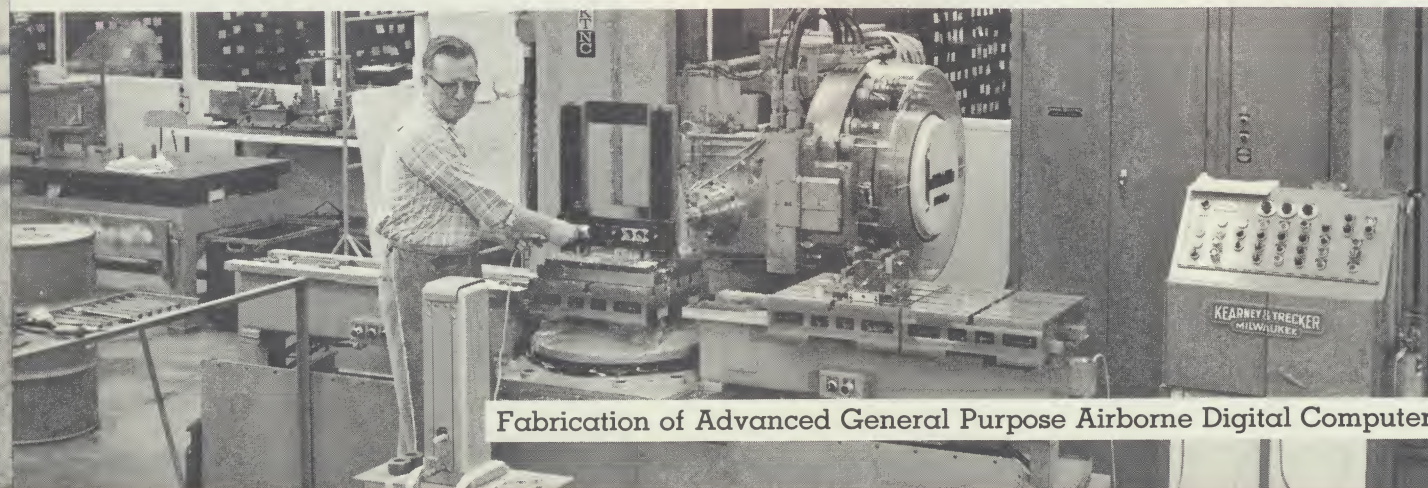
Electrical Discharge Machining

Facilities

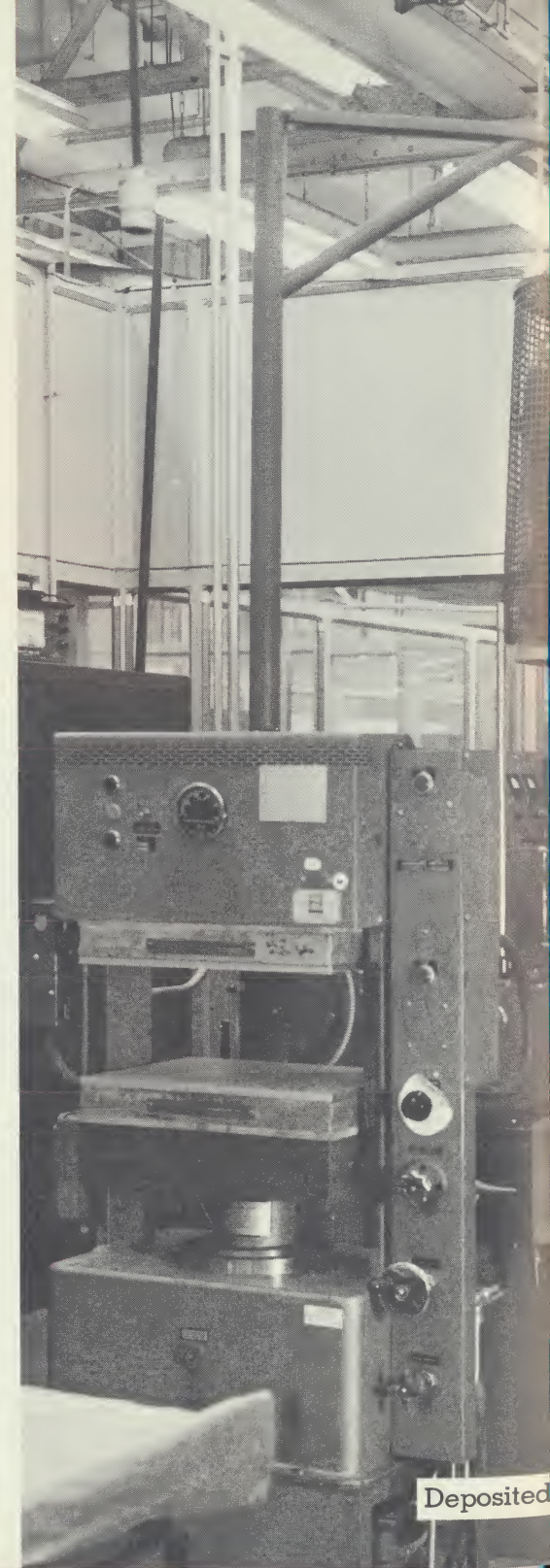
PRECISION FABRICATION

The use of advanced materials, such as beryllium and ceramics, in inertial instrument design, plus the demand for precision machining, have led AC to perform some of the industry's most precise manufacturing operations as a matter of daily routine. For example, AC pioneered in the use of large capacity ultrasonic machining tools in the manufacture of aerospace equipment, and quickly became a recognized authority in the field.

Using electrical discharge machining, ultrasonic impact machining, and chemical machining, the capability exists to produce bore squareness of 10 millionths, concentricity of 30 millionths, and surface finishes of 5 to 10 microinches on low-density, high-strength materials such as beryllium.



Fabrication of Advanced General Purpose Airborne Digital Computers

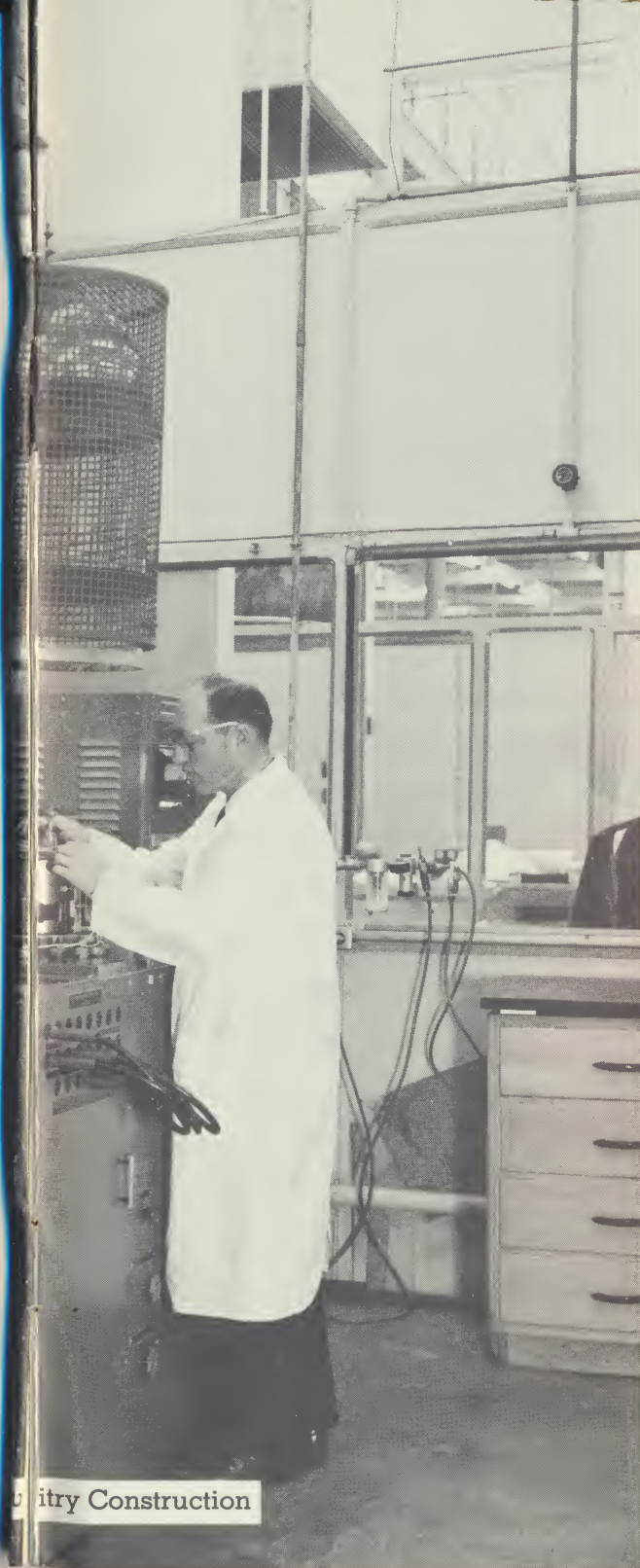


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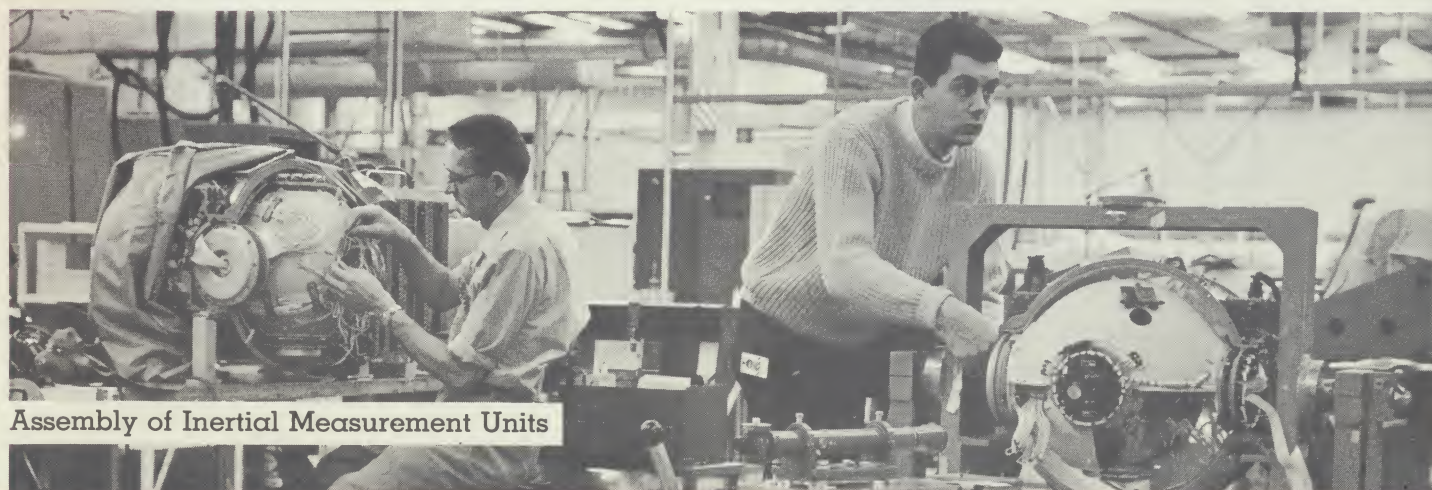
Facilities SYSTEMS ASSEMBLY

Assembly processes involve not only extreme care and precision in physical mating of parts and components, but closely regulated environments as well. Clean rooms and other unique facilities afford environmental control; specially developed assembly techniques supplemented by skills training and process descriptions assure the highest standards of workmanship.

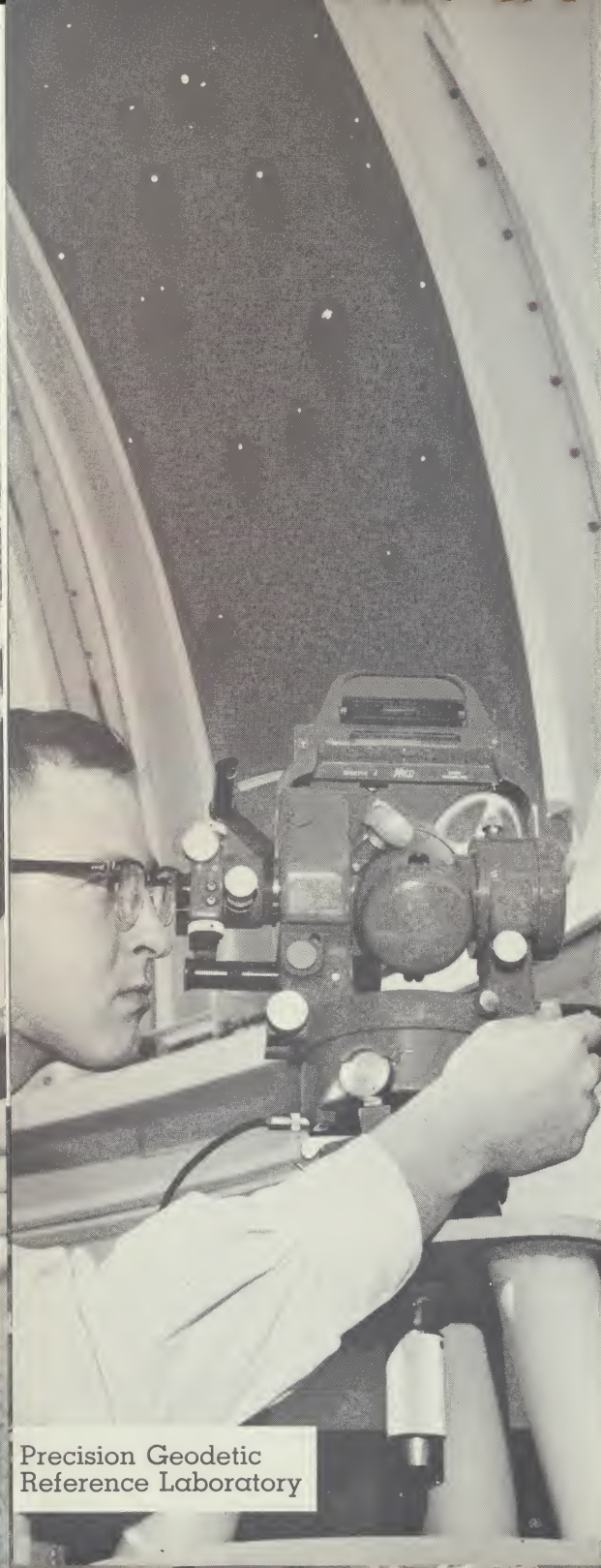
AC has become so skilled at systems assembly, interconnection, and alignment that on many programs AC has responsibility not only for the marriage and checkout of its own equipment, but for that supplied by other contractors as well.



uity Construction



Assembly of Inertial Measurement Units



Precision Geodetic
Reference Laboratory

Facilities

QUALITY ASSURANCE AND TESTING

To assure that its products meet the quality standards expected, AC maintains its own metrology laboratory, with standards unexcelled anywhere but at the National Bureau of Standards. The laboratory contains one of the few industry-owned precision geodetic azimuth observatories, providing a continuous true north reference for the laboratories, test stations, and production areas. An environmental test complex is also maintained which is capable of reproducing the entire range of environmental extremes encountered by both earthbound and space vehicles. As ultimate proof of product performance, AC conducts rocket sled and flight testing of operational systems.

Facilities FIELD SUPPORT AND TRAINING

Operational support begins early at AC. Maintenance engineering personnel participate in the development phase, helping design a "maintainable" system, and establishing support requirements. At the same time, customer training and documentation needs are analyzed, and training aids and technical manuals prepared.

Training of customer personnel and AC personnel scheduled for field assignment is conducted prior to first site activation. After transfer of responsibility, AC continues to provide both field and in-plant technical assistance to assure continued product effectiveness during use.



TITAN II Flight Testing at AMR

GENERAL
MOTORS

Management RESPONSIBILITY

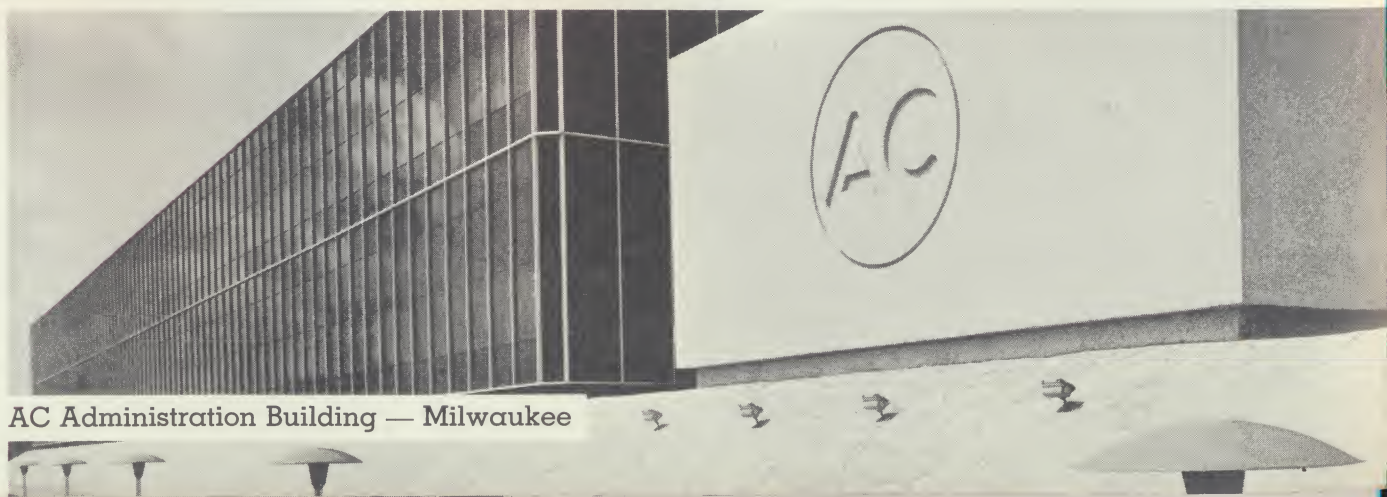
The General Motors Corporation employs more than 600,000 persons in operations extending over 19 foreign countries and encompassing hundreds of products and services.

As with other members of this world-wide General Motors family, AC Electronics Division has flourished in an open, competitive environment through progressive management, an uncompromising policy of maintaining product excellence, and a complete dedication to customer service.

Traditionally, this entire capacity has been made available when needed by agencies of the United States Government. Having made sustained investments to assure the excellence of its facilities, AC Electronics is eager to provide even greater contributions to America's military and space programs.



General Motors Building — New York City



AC Administration Building — Milwaukee

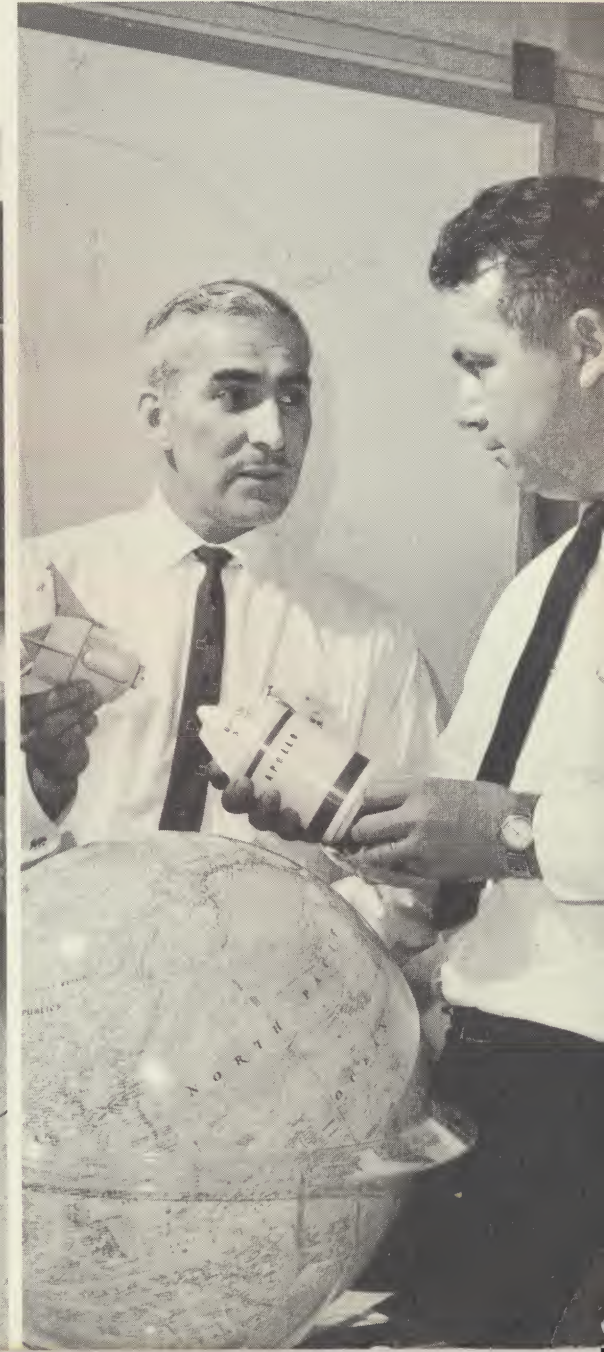
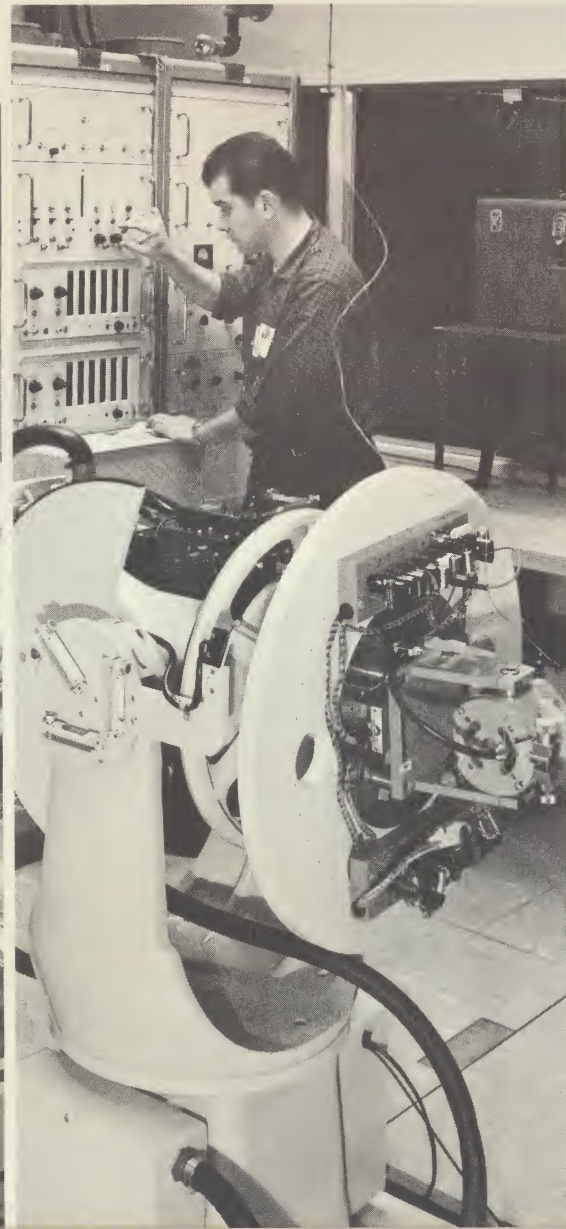
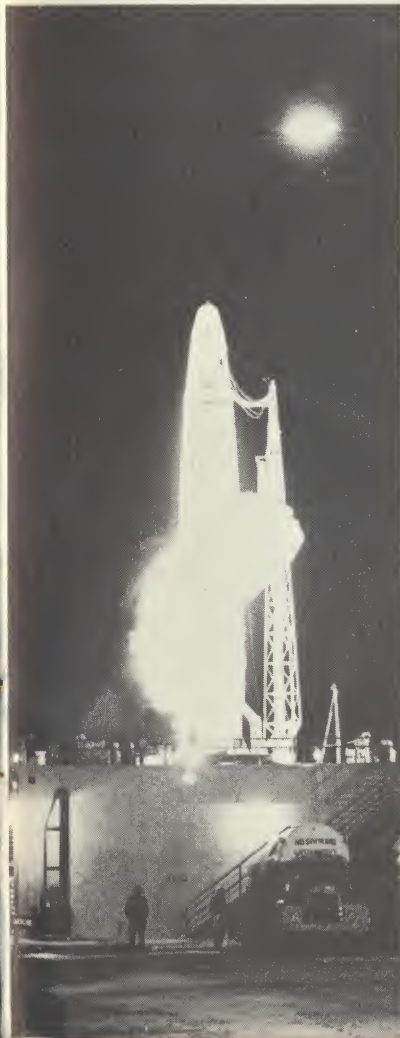
CAPABILITY

Management

Facilities

Technology

Experience



Sales Offices

AC ELECTRONICS DIVISION

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3322 Memorial Parkway, S. W.
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118 West First Street
Phone: 445-5030

TEXAS — Houston
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Phone: 591-2415

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950 North Sepulveda Boulevard
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515 Arrowhead Avenue
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MASTER NAVIGATORS THROUGH TIME AND SPACE